



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G06F 1/00		A1	(11) International Publication Number: WO 99/15947 (43) International Publication Date: 1 April 1999 (01.04.99)
(21) International Application Number: PCT/KR97/00175 (22) International Filing Date: 19 September 1997 (19.09.97) (71)(72) Applicant and Inventor: PARK, Hyo, Joon [KR/KR]; Kwacheon Jugong Apt. 408-504, 7 Byalyang-dong, Kwacheon-si, Kyungki-do 427-040 (KR).		(81) Designated States: JP, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>	
(54) Title: SOFTWARE LICENSE CONTROL SYSTEM BASED ON INDEPENDENT SOFTWARE REGISTRATION SERVER (57) Abstract The registration servers are independent of software product manufacturers and open to all software manufacturers. On user computer, software product asks user software license control program whether the user has usage license for the software product. The user license control program checks the license file, which was received from a software registration server, and answers the software product. If the answer is "no", the software product stops running. If the answer is "yes", it continues. Said license file cannot be used by unauthorized user because said file is encrypted by the user public key and digital signed by the secret key of a software registration server. To use a license file, user needs the secret key of the user and needs passphrase to activate the secret key. The license file is digital signed by software registration server and cannot be modified by a user to add unauthorized license. There are 3 types of registration need to be done by user. User registration, CPU registration and software product usage license registration. User does user registration for himself once per person. After that, the user registers his CPU once per CPU. User registers software product usage license once per every product of specific CPU. On user registration, the user gets partial user-ID file from the software registration server. After receiving the partial user-ID file, user software license control program attaches public/secret key pair of the user and public key of the registration server of the user to the partial user-ID file. This user-ID file is essential in registering CPU and purchasing software product. The user-ID file is independent of any CPU and this file need to be copied to all of his CPUs. On CPU registration, user gets license file from software registration server. And the license file is updated every time the user purchases new software product or upgrades a software product. The software product information is added to the license file every time new product is purchased or a product is upgraded. Also because of expiration date, the license file is refreshed periodically. Software product usage license is given to a specific CPU of a specific user. The license file is dependent on a specific CPU. The license file is given to a specific CPU of a specific user. Both the user-ID file and license file is encrypted by user public key and digital signed by software registration server secret key. So, only the registration server can modify said files.			

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	HU	Hungary	TR	Turkey
BG	Bulgaria			ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon	KR	Republic of Korea	PL	Poland		
CN	China	KZ	Kazakhstan	PT	Portugal		
CU	Cuba	LC	Saint Lucia	RO	Romania		
CZ	Czech Republic	LI	Liechtenstein	RU	Russian Federation		
DE	Germany	LK	Sri Lanka	SD	Sudan		
DK	Denmark	LR	Liberia	SE	Sweden		
EE	Estonia			SG	Singapore		

Title of invention

Software license control system based on independent software registration server

Technical field

Software license control

Background art

Software license control, cryptography

Publication – Garfinkel, Simson. PGP(Pretty Good Privacy).

Schneier, Bruce. Applied Cryptography

Disclosure of invention

The registration server is independent of software product manufacturers and open to all software manufacturers. On user computer, software product asks user software license control program whether the user has usage license for the software product. The user license control program checks

the license file, which was received from a software registration server, and answers the software product. If the answer is "no", the software product stops running. If the answer is 'yes', it continues. Said license file cannot be used by unauthorized user because said file is encrypted by the user public key and digital signed by the secret key of a software registration server. To use a license file, user needs the secret key of the user and needs passphrase to activate the secret key. The license file is digital signed by software registration server and cannot be modified by a user to add unauthorized license.

All software product manufacturers register their products to the central software registration server. The central registration server distributes the registered product information to software registration servers all over the world. There are 3 types of registration need to be done by user. User registration, CPU registration and software product usage license registration. User does user registration for himself once per person. After that, the user registers his CPU once per CPU. User registers software product usage license once per every product of specific CPU. All the registration is done after the connection to a software registration server. On user registration, the user gets partial user-ID file from the software registration server. After receiving the partial user-ID file, user software license control program attaches public/secret key pair of the user and

public key of the registration server of the user to the partial user-ID file. This user-ID file is essential in registering CPU and purchasing software product. The user-ID file is independent of any CPU and this file need to be copied to all of his CPUs. On CPU registration, user gets license file from software registration server. And the license file is updated every time the user purchases new software product or upgrades a software product. The software product information is added to the license file every time new product is purchased or a product is upgraded. Also because of expiration date, the license file is refreshed periodically. Expiration date or refresh period prevents unauthorized long-term use of the user-ID file or license file. Software product usage license is given to a specific CPU of a specific user. To purchase a software product, user selects product category, and then user license control program displays all relevant software products in that product category and user selects the software product. Then, the user license control program sends software product purchase request to the software registration server. The license file is dependent on a specific CPU. The license file is given to a specific CPU of a specific user. Both the user-ID file and license file is encrypted by user public key and digital signed by software registration server secret key. So, only the registration server can modify said files. In addition to above method – called user/CPU based license, there are two more methods. One is user-based license. The license

is given to a specific user without having any CPU restriction on its license file. This license can be used on any CPU and strongly controlled by the user. The other method is CPU-based license. The license is given to a specific CPU without having any user restriction on its license file.

Normally license file is encrypted by user public key but CPU based license file is encrypted by the CPU public key. For CPU based license, one pair of secret/public key is created just for the CPU. In case of User/CPU based license and user based license, the pair of secret/public key of the user is used without creating new key pair for the CPU. In case of company, there is an owner in addition to an user of a PC/workstation. This owner has right to change the user of a PC/workstation. If an employee quits the company, the company (owner) is to assign new user to the PC/workstation. There is owner information in addition to user information in license file.

Best mode for carrying out the invention

Method of software license control based on independent software registration server comprising the steps of:

- creating secret/public key pair for a user by the user software license control program on the user computer. Key pair for a user can be created

optionally by the registration server on the registration server site.

. connecting software registration server by selecting one from the software registration server list, sending said user's public key to said registration server and receiving the public key of said registration server. Said software registration server is open to all software product manufacturers and is not just for one software manufacturer.

. registering user once per person to the software registration server and receiving partial software registration server. User software license control program attaches the user secret/public key pair and the public key of the user's software registration server to the partial user-ID file user-ID file that includes user information encrypted by user public key and digital signed by. This user-ID file is essential in registering CPU and in registering software product usage license.

. registering CPU for his computer hardware once per CPU to said software registration server and receiving license file that includes CPU information encrypted by user public key and digital signed by software registration server secret key.

. purchasing software product and registering it to said software registration server and receiving updated license file which now includes the purchased software product information in addition to CPU information. This new license file replaces the old license file.

. distributing software product. Said software product is digital signed by software registration servers, central software registration server or the software product manufacturer. Said digital signed software product can be downloaded from the software product manufacturer, any software registration server or any FTP site.

. validating software product usage license. Software product asks user software license control program on user computer whether the user has usage license for the software product of the specific CPU. User software license control program checks the license file and answers the software product. If the answer is no, the product stops running. The software product usage license is given to a specific CPU of a specific user.

. storing user information, CPU information and software product usage license information in software registration server database.

. replicating software registration server database to central software registration server database for backup purpose and for cross software registration server function such as the change of software registration server and change of user who is registered to a different software registration server from the former user.

. registering software products to central software registration server by software product manufacturers. Registered software product information includes product ID, price, prerequisite software, etc. Central software

registration server distributes the product information to all software registration servers in the world. So, user can select software product from the registered software product list. If user knows the product ID, he can decide software product just by entering product ID without following said procedure.

- . updating user-ID file and license file based on expiration date or refresh period. Expiration date or refresh period prevents unauthorized long-term use of the user-ID file or license file.
- . changing the user of a CPU by the owner of the CPU in case of user change. License file has owner information.
- . connecting software registration server before having license file for operating system and network program. Special operating system and network program, which doesn't check the usage license in such level function as just connecting to registration center and registering software product usage licenses, removes the difficulty to get usage license for operating system and network program that is required to register themselves. Instead of using special operating system and network program, user software license control program can give the limited license file to operating system and network system, which can be used within test period.

Industrial applicability

Software license control system works based on following servers and Software packages:

- . Central software registration server gets software product information from all software product manufacturers and distributes the registered product information to software registration servers all over the world. Said central registration server does the interface between all software product manufacturers and software registration centers.
- . Normal software registration servers give user the software product information that is given by said central software registration server, get registration request from users and give license file to users.
- . Software packages for general users, normal software registration servers, central software registration server and software product manufacturers.

What is claimed is:

1. Method of software license control based on independent software registration server comprising the steps of:
 - . creating secret/public key pair for a user by the user software license control program on the user computer. Key pair for a user can be created optionally by the registration server on the registration server site.
 - . connecting software registration server by selecting one from the software registration server list, sending said user's public key to said registration server and receiving the public key of said registration server. Said software registration server is open to all software product manufacturers and is not just for one software manufacturer.
 - . registering user once per person to the software registration server and receiving partial user-ID file that includes user information encrypted by user public key and digital signed by software registration server. User software license control program attaches the user secret/public key pair and the public key of the user's software registration server to the partial user-ID file. This user-ID file is essential in registering CPU and in registering software product usage license.
 - . registering CPU for his computer hardware once per CPU to said software

registration server and receiving license file that includes CPU information encrypted by user public key and digital signed by software registration server secret key.

. purchasing software product and registering it to said software registration server and receiving updated license file which now includes the purchased software product information in addition to CPU information. This new license file replaces the old license file.

. distributing software product. Said software product is digital signed by software registration servers, central software registration server or the software product manufacturer. Said digital signed software product can be downloaded from the software product manufacturer, any software registration server or any FTP site.

. validating software product usage license. Software product asks user software license control program on user computer whether the user has usage license for the software product of the specific CPU. User software license control program checks the license file and answers the software product. If the answer is no, the product stops running. The software product usage license is given to a specific CPU of a specific user.

. storing user information, CPU information and software product usage license information in software registration server database.

. replicating software registration server database to central software

registration server database for backup purpose and for cross software registration server function such as the change of software registration server and change of user who is registered to a different software registration server from the former user.

. registering software products to central software registration server by software product manufacturers. Registered software product information includes product ID, price, prerequisite software, etc. Central software registration server distributes the product information to all software registration servers in the world. So, user can select software product from the registered software product list. If user knows the product ID, he can decide software product just by entering product ID without following said procedure.

. updating user-ID file and license file based on expiration date or refresh period. Expiration date or refresh period prevents unauthorized long-term use of the user-ID file or license file.

. changing the user of a CPU by the owner of the CPU in case of user change. License file has owner information.

. connecting software registration server before having license file for operating system and network program. Special operating system and network program, which doesn't check the usage license in such level function as just connecting to registration center and registering software

product usage licenses, removes the difficulty to get usage license for operating system and network program that is required to register themselves. Instead of using special operating system and network program, user software license control program can give the limited license file to operating system and network system, which can be used within test period.

2. A method according to claim 1 wherein connecting to the only one software registration server automatically. Only one registration server exists in the world and does all registration service.

Consequently, there is no replication from registration server to central registration server and no distribution of registered product information from central registration server to registration servers, since there is only one server.

3. A method according to claim 1 wherein validating software product usage license without giving limitation to a specific CPU. User software license control program on user computer doesn't check CPU information if "user based license" indicator is on in license file.

4. A method according to claim 1 wherein validating software product usage license without giving limitation to the specific user described in license file. User software license control program on user computer doesn't check user information if "CPU based license" indicator is on in license file.

Instead of entering "user passphrase" user enters "passphrase of the CPU".

In registering CPU for the computer once per CPU, user software license control program creates secret/public key pair for the CPU and sends the public key to software registration server. The license file is encrypted by the CPU public key and digital signed by software registration server

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 97/00175

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁶: G 06 F 1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁶: G 06 F 1/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

EPODOC

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 553 143 A (ROSS) 03 September 1996 (03.09.96), abstract; fig. 2-3; fig. 7B.	
A	US 5 490 216 A (RICHARDSON) 06 February 1996 (06.02.96), abstract; fig. 1-3; fig. 6,8,10.	
A	US 5 568 552 A (DAVIS) 22 October 1996 (22.10.96), abstract; fig. 1-2, fig. 6-7.	

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

29 June 1998 (29.06.98)

Date of mailing of the international search report

16 July 1998 (16.07.98)

Name and mailing address of the ISA/Austrian Patent Office
Kohlmarkt 8-10; A-1014 Vienna
Facsimile No. 1/53424/535

Authorized officer

Fastenbauer
Telephone No. 1/53424/447

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 97/00175

In Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche		Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US A	5553143	03-09-96	AU A1 67317/94 AU B2 687058	17-08-95 19-02-98
US A	5490216	06-02-96	AU B2 678985 CN A 1103186 EP A1 689697 IL A0 107044 NZ A 255971 WO A1 9407204 JP T2 8504976	19-06-97 31-05-95 03-01-96 28-12-93 26-05-97 31-03-94 28-05-96
US A	5568552	22-10-96	AU A1 35832/95 EP A1 780039 US A 5473692 WO A1 9608092	27-03-96 25-06-97 05-12-95 14-03-96